General Computer Science for Engineers CISC 106 Lecture 15

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Lecture Overview

- User Inputs
- Arrays and subarrays
- Nested Loops

User Input

- Input function displays a prompt waits for the user to respond

value = input('Enter an input value:')

Enter an input value: 1.25

Value =

1.2500

User Input

- Input function displays a prompt waits for the user to respond

name = input('What is your name', 's')

What is your name: Pinar

name=

Pinar

Arrays

- Each dimension must have same length
- a = [2 3 4; 5 6 7]

  a = 2 3 4

      5 6 7
- a = [1 2 3; 4 5]

  error!

Initialize using built-in functions

- x=zeros(2)
- x = 0 0

  0 0
- x = zeros(2,3)

  x = 0 0 0

  0 0 0

Subarrays

- It will help with problem 4 (magic squares) on the lab
- Although you do not need it, it could make life easier

isMagicSquare.m

- Problem 4 of the lab
- Boolean function is a logical function
  - Returns true or false
- Extra credit for that problem
  - Check that number in the matrix is different as well
  - http://www.udel.edu/CIS/106/cavazos/09S/labs/lab5questions.html

Subarrays

- It is possible to select and use subsets of MATLAB arrays.

arr1 = [1.1 -2.2 3.3 -4.4 5.5];

arr1(3) is 3.3

arr1([1 4]) is the array [1.1 -4.4]

arr1(1 : 2 : 5) is the array [1.1 3.3 5.5]

Subarrays

- For 2-dimensional arrays, colon can be used .

```
arr2 = [1 2 3; -2 -3 -4; 3 4 5]
arr2(1,:)
   1 2 3
arr2(:,1:2:3)
    1     3
   -2    -4
    3     5
```

Subarrays

- end function: returns highest value taken on by that subscript

arr3 = [1 2 3 4 5 6 7 8]

arr3(5:end) is array [5 6 7 8]

Subarrays

```
arr4=[1 2 3 4; 5 6 7 8; 9 10 11 12];
     1   2  3   4
     5   6  7   8
     9 10 11 12

arr4=(2:3, 2:4);
       6  7   8
      10 11 12
```

Subarrays

- arr4=[1 2 3 4; 5 6 7 8; 9 10 11 12];

arr4(1:2,1:2) = 1

1 1 3 4

1 1 7 8

9 10 11 12

Loop calculations

- a = [3 40 1 8 0];
- b = [-7 5 -4 16 1];

```
for i = 1:5
   c(i) = a(i) + b(i);
```

c = [-4 45 -3 24 1];

Doubly-nested loop

```
arr4=[1 2 3 4; 5 6 7 8; 9 10 11 12];
```

```
1   2  3   4
5   6  7   8
9 10 11 12
```

```
for i=1:3
   for j=1:4
      arr4(i,j)
   end
end
```

Another nested for loop

```
for i=1:5
  for j=1:5
        a(i,j)=10*i+j;
  end
end
```